

# SROOR MAGED ABDELHAY MOHAMED ELNADY

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**Date of Birth:** 22 July 1993

**PhD Thesis Defense:** 11 June 2025

## Current Research:

- *Developing extended fractional-order PV and battery models using unified generalized (UG) operators.*
- *Applying adaptive fractional FISTA (A-FISTA) for denoising and parameter estimation in microgrid systems.*

## Publications

- [1] **Elnady, S. M.**, El-Beltagy, M., Radwan, A. G., & Fouda, M. E. (2025). A generalized local fractional derivative with applications. *Journal of Computational Physics*, 530, 113903. <https://doi.org/10.1016/j.jcp.2025.113903>
- [2] **Elnady, S. M.**, El-Beltagy, M., Radwan, A. G., & Fouda, M. E. (2025). A comprehensive survey of fractional gradient descent methods and their convergence analysis. *Chaos, Solitons & Fractals*, 194, 116154. <https://doi.org/10.1016/j.chaos.2025.116154>
- [3] El-Beltagy, M., Etman, A., & **Maged, S.** (2022). Development of a fractional Wiener-Hermite expansion for analyzing the fractional stochastic models. *Chaos, Solitons & Fractals*, 156, 111847. <https://doi.org/10.1016/j.chaos.2022.111847>
- [4] **Elnady, S. M.**, El-Beltagy, M., Radwan, A. G., & Fouda, M. E. Dynamic Adaptation in Gradient Descent: An Advanced Framework for Enhanced Convergence and Stability. *Applied Soft Computing*. (**Under Second Review**)
- [5] **Elnady, S. M.**, Eid, K. M., El-Beltagy, M., Radwan, A. G., & Fouda, M. E. Data-driven Black-box Modeling and Forecasting for Photovoltaic Systems. *Journal of The Electrochemical Society*. (**submitted**)
- [6] **Elnady, S. M.**, El-Beltagy, M., Fouda, M. E., & Radwan, A. G. A Survey on the Chain Rule for Fractional Derivatives: Theories, Challenges, and Directions. *Mathematical Methods in the Applied Sciences – Wiley*. (**Under Review**)

## Educational

2022-present	<b>PhD in Engineering Mathematics, Cairo University (CUFE).</b> Thesis Title: “Generalized Fractional Operators and Dynamic Gradient Methods with Applications” <b>Relevant Focus:</b> Development of control, optimization, and decision-support frameworks inspired by fractional-order systems, with applications in energy networks and resource management systems.
2018 – 2021	<b>MSc in Engineering Mathematics, Cairo University (CUFE).</b> Thesis Title: “Development of a fractional Wiener-Hermite expansion for analyzing the fractional stochastic models” <b>Energy Application Note:</b> Investigated uncertainty modeling in energy systems, supporting reliability, forecasting, and resource allocation in renewable microgrid planning. GPA: <b>3.8</b> Thesis defense: October 2021
2011 – 2016	<b>BSc in Electrical Engineering, CUFE.</b> <b>Energy Focus:</b> Strong academic grounding in electric power systems, smart grids, and distribution networks, complemented by projects in energy-efficient building systems. Grade: Distinction with Honors ( <b>88.53%</b> ) Rank: <b>5<sup>th</sup></b> Graduation Date: July 2016

## Research and Work Experience

March 2018 – (present)	<b>Research and Teaching Assistant</b> , Department of Engineering Mathematics and Physics, CUFE. <ul style="list-style-type: none"><li>• <b>Research:</b> Fractional calculus and stochastic modeling for optimization in smart energy systems.</li><li>• Designed optimization algorithms for robust control, learning under uncertainty, and dynamic resource allocation — applicable to smart mobility systems, microgrids, and logistics networks.</li><li>• Delivered undergraduate courses related to system modeling, control theory,</li></ul>
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and power system mathematics.

2021-2022

**Electric Power Design Engineer (Part-time)**, ICE ELEC Consultant Office

- Designed **electrical distribution and lighting systems** for commercial and residential buildings.
- Applied **energy-efficient standards and simulation tools** aligned with green building regulations.

October 2016-2018

**Tender and Technical Office Engineer**, SMART POWER (MEP Contracting)

- Prepared technical proposals for **smart metering systems and power distribution projects**.
- Collaborated on projects integrating **renewable energy sources and energy management solutions**.

July (2015 –2016)

**Graduation Project:** Design of consultancy and light current systems for NARSS (National Authority for Remote Sensing & Space Sciences)

- Designed **low-voltage and control circuits** for advanced infrastructure.
- Integrated **remote monitoring and power control components** in line with national standards.

## CONFERENCES AND PRESENTATIONS

ICMA24

Oral Presentation: A New Local Fractional Derivative with Applications, 6th International Conference for Mathematics & Its Applications (ICMA24) – “Artificial Intelligent and Computational Mathematics,”  
Emphasis on optimization techniques and control strategies relevant to smart microgrids.

## QUALIFICATIONS AND SKILLS

- **Power Systems Engineering:** Smart grids, DC/AC microgrid modeling, energy storage, power distribution
- **Mathematical Modeling & Optimization:** Fractional-order control, gradient descent optimization, and robust adaptive estimation techniques
- **Simulation & Tools:** MATLAB, Simulink, Python, C/C++, DIALux, AutoCAD, Proteus
- **Soft Skills:** Analytical thinking, fast learner, capable under pressure, effective communicator

### Languages:

Arabic

Native

English

Proficient

## References

### Name

Prof. Mohamed A. El-Beltagy

Prof. Ahmed G. Radwan

Mohammed E. Fouda

### Affiliation

Cairo University

Nile University

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